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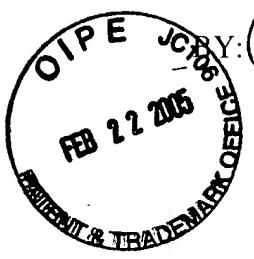
BY: Renee Conti Date: February 16, 2005



MAIL STOP APPEAL BRIEF - PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Patent Application of: Ulrich Reiners et al.			
Conf. No.:	4175	Group Art Unit:	1773
Appln. No.:	09/851,460	Examiner:	Kevin R. Kruer
Filing Date:	May 8, 2001	Attorney Docket No.:	9784-3U2 (TH8002US/B)

Title: THERMO-FORMABLE MULTILAYER BARRIER FILM WITH THE APPEARANCE AND TEXTURE OF PAPER

ON APPEAL FROM THE PRIMARY EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPELLANT'S BRIEF UNDER 37 C.F.R. § 41.37

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TABLE OF CONTENTS

1. Declaration Under 37 C.F.R. § 1.132 of Walter Bernig
2. Second Declaration of Walter Bernig Under 37 C.F.R. § 1.132

I. REAL PARTIES IN INTEREST

This application is assigned to Convenience Food Systems B.V. of Kempten, Germany, by an Assignment recorded on August 16, 1999, at Reel 010167, Frame 0473. Accordingly, Convenience Food Systems B.V. is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

Appellants, their assignees, and their legal representatives are unaware of the existence of any related appeals and interferences that will directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-20 are pending in this application. In an Office Action, mailed February 13, 2004 (Paper No. 20040203), claims 1-20 were finally rejected under 35 U.S.C. § 103(a) on the grounds discussed below.

Claims 1-20 are appealed. The text of claims 1-20, as pending, is attached hereto as Appendix A.

IV. STATUS OF AMENDMENTS

All amendments have been entered, as have the Declarations under 37 C.F.R. § 1.132 (see Appendix B).

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention is directed to a multilayer barrier film which has a paper-like appearance and is suitable for thermo-forming and sealing, particularly on form-fill-seal (FFS) machines, so that the multilayer barrier film can be easily processed into packages for perishable foods (specification page 2, lines 21-24 and page 6, lines 3-6 and 12-15). The

features of claim 1 can be diagramed as follows, with the support for each element being given by reference to the page and line numbers of the specification:

Claim 1: A multilayer barrier film comprising

1 a filled layer (page 2, line 26);

1.1 based on polypropylene (page 2, line 27; page 3, lines 11-17);

1.2 filled with 40-75 wt.-% of an inorganic filler based on the total weight of the filled layer (page 3, lines 18-20);

1.3 forming one of the two surface layers of the film, and (page 2, lines 28-29);

1.4 having a thickness of 40 to 400 µm (page 3, lines 24-25); and

2 a plurality of unfilled layers comprising (page 2, line 27);

2.1 a sealing layer forming the other of the two surface layers of the film, (Ex. 1, Layer E, page 8, lines 12-27);

2.2 at least a barrier layer sandwiched between the filled layer and the sealing layer, (Ex. 1, Layer C, page 8, lines 12-27);

2.3 optionally at least one adhesive layer, (page 3, line 1; page 4, lines 1-3, 13-15); and

3 the ratio of the total thickness of the unfilled layers to the thickness of the filled layer being from 1:8 to 1:1.2 (page 3, lines 2-3; page 5, lines 23-26).

The multilayer barrier film is particularly useful as a packaging material (claims 13 and 14) for perishable foods, such as meat and poultry, where the packaging is carried out on an FFS-machine by thermoforming (page 6, lines 12-20). The packaging (claims 15-17 and 20) may be in the form of a tray-like lower part produced from the multilayer barrier film with a lidding film sealed to the sealing layer of the multilayer barrier film (page 6, line 21-page 7, line 2).

For printing of the multilayer barrier film (claim 12), the film may be pretreated by corona, flame, fluorine or plasma pretreatment (page 7, lines 22-26).

The invention is directed to the problem of improving thermoformability of a multilayer barrier film while still maintaining the paper-like appearance of the film, and particularly a film which is suitable for thermoforming and sealing on FFS-machines for easy processing into multilayer barrier film packages for perishable foods (page 2, lines 17-24). Because packaging on FFS-machines is often carried out discontinuously, the film must show a particularly broad temperature window in which the thermoforming of the film can occur (page 6, lines 16-17).

One way of measuring for the quality of the film is the width of the processing window, which is defined by the packaging speed and the thermoforming temperature. It is desired to have a high packaging speed with a very broad range of thermo-forming temperature, i.e., the regulated temperature of the heating zone of the packaging machine. The paper-like appearance of the film is judged subjectively by the appearance and touch of the film (page 8, lines 1-7).

The structure of the multilayer barrier film of the invention is not only excellently suitable for thermoforming, but also shows a paper-like appearance, particularly when formed as a packaging material on FFS-machines (page 6, lines 3-6). Quite surprisingly, the asymmetrically composed film of the invention leads to especially deep drawing qualities (page 6, lines 18-20), and the paper-like character remains unaffected after the forming, filling and sealing steps (page 7, lines 3-5).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Claims 1-4, 6, 7, 10, 11, 18 and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 4,526,823 of Farrell et al. ("Farrell") in view of U.S. Patent 4,578,296 of Miyazaki et al. ("Miyazaki").

B. Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Farrell in view of Miyazaki, as applied above, and further in view of U.S. Patent 5,635,011 of Rosen ("Rosen").

C. Claims 1-4, 6, 7, 9-15, 18 and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,011,735 of Schirmer ("Schirmer") in view of Miyazaki.

D. Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Schirmer in view of Miyazaki, as applied above, and further in view of Rosen.

E. Claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Schirmer in view of Miyazaki, as applied to claims 1-4, 6, 7, 9-15, 18 and 20 above, and further in view of U.S. Patent 5,449,552 of Bochow et al. ("Bochow").

F. Claims 16, 17 and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schirmer in view of Miyazaki, as applied to claims 1-4, 6, 7, 9-15, 18 and 20 above, and further in view of Applicant's Admissions.

G. Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Farrell or Schirmer in view of Miyazaki as applied above, and further in view of U.S. Patent 5,108,844 of Blemburg et al. ("Blemburg").

H. Claims 1, 2, 4, 6-11, 13, 14, 18 and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bochow in view of U.S. Patent 4,567,089 of Hattori et al. ("Hattori").

The above grounds of rejection can be grouped into three basic combinations of references as follows:

1. Rejections over Farrell in view of Miyazaki (grounds A, B and part of G);

2. Rejections over Schirmer in view of Miyazaki (grounds C, D, E, F and part of G); and

3. Rejections over Bochow in view of Hatori (ground H).

VII. ARGUMENT

Introduction: The Properties of the Multilayer Barrier Film of the Invention Must be Considered and Its Advantages Must be Understood to Properly Evaluate the Applicability of the Prior Art.

The preamble of claim 1 originally referred to the film as a "a paper-like multilayer barrier film." In view of an indefiniteness rejection by the Examiner, this preamble was changed to "a multilayer barrier film with an appearance and texture of paper." The Examiner again rejected this language as indefinite. Ultimately, these descriptive modifiers of the film were deleted, because the Examiner agreed that such terms were unnecessary as being statements of properties or advantages of the film having the claimed structure.

1. Desired Properties/Advantages

Nevertheless, before discussing the prior art and the Examiner's rejections, it is important to understand the properties and/or advantages of the multilayer barrier film of the invention. These properties are therefore discussed below with particular reference to form-fill-seal-machines (FFS-machines) on which the thermoforming is preferably carried out, as specifically claimed in claims 13 and 14.

A form-fill-seal machine performs three consecutive processing steps:

- in the first step a laminate sheet of the multilayer barrier film is thermoformed thereby producing a cavity of predetermined size and shape ("form");
- in the second step the item to be packed is introduced into said cavity ("fill"); and
- in the third step the packaging is closed ("seal").

As the thermoforming step is conducted immediately before the filling step, the film must allow thermoforming upon exposure to heat, but after the thermoforming step the material must rapidly regain its original mechanical properties, particularly a certain degree of stiffness (page 1, line 18 – page 2, line 2). As packaging on FFS-machines is very often carried out discontinually, the material of the film must show a particularly broad temperature window within which the thermoforming of the film can occur (page 6, lines 15-17).

Further, printing of the packaging should be easy with high precision and adhesion of the printing. Still further, the film should allow piling-up of many packages made of the film during storage and/or allow for resting on a shelf without any disarrangement.

Thus, it is desirable, inter alia, that such a film exhibit the following properties simultaneously:

(i) the paper-like appearance should be maintained after thermoforming;

(ii) thermoforming should be possible within a broad temperature range;

(iii) processing should be possible at a high packaging speed;

(iv) printing should be easy with high precision and adhesion; and

(v) the surface of the film should allow piling-up of many packages during storage.

Therefore, it is an object of the invention to provide a multilayer barrier film with a paper-like nature, which is suitable for thermoforming and sealing especially well on FFS-machines and thus can easily be processed to multilayer barrier film packages of perishable food on FFS-machines (page 2, lines 21-24). Furthermore, the film should exhibit excellent printing and storage properties.

In other words, the invention aims at providing a multilayer barrier film exhibiting all of the above properties (i), (ii), (iii), (iv) and (v) simultaneously.

2. Experimental Evidence of Properties/Advantages

Applicant has submitted experimental evidence demonstrating the properties and advantages of the films according to the invention, including:

(a) The experimental results disclosed in the application as originally filed (Examples 1, 2, C-1, C-2 at pages 8-10 of the specification),

(b) The experimental results submitted with the Declaration Under 37 C.F.R. § 1.132 of Walter Bernig dated January 7, 2002, filed January 7, 2002 (Tests Ia, IIa, Ib, IIb) ("first Bernig declaration") – See Appendix B1, and

(c) The experimental results submitted with the Second Declaration of Walter Bernig under 37 C.F.R. § 1.132 of Walter Bernig dated March 10, 2003, filed on March 11, 2003 (Tests IIa, IIb, IIc, IId, IIe, IIIa, IIIb, IIIc) ("second Bernig declaration") see Appendix B2.

The data from all of these experiments are summarized below in Table I, sorted according to a decreasing ratio of the total thickness of the unfilled layers to the thickness of the filled layer (i.e., feature 3 of claim 1).

TABLE I

	comparative				according to the invention									comparative		
	C-1	**IIIa[2]**	**IIIb[2]**	**IIa[1]**	**IIb[2]**	**IId[2]**	**IIa[2]**	**IIe[2]**	**Ia[1]**	**1**	**2**	**Ib[1]**	**IIc[2]**	**IIIc[2]**	**IIb[1]**	**C-2**
filled layer - µm	500	250	290	350	225	260	200	210	200	200	61	60	45	40	60	40
interposed layer - µm	-	-	-	10	-	-	-	-	10	-	-	15	-	-	23	-
adhesive layer - µm	5	-	-	3	-	-	-	-	3	5	2	3	-	-	3	2
barrier layer - µm	10	10	10	4	10	10	10	10	4	10	10	4	10	10	4	10
adhesive layer - µm	5	-	-	3	-	-	-	-	3	5	2	3	-	-	3	2
sealing layer - µm	30	20	25	20	20	25	20	25	20	30	25	23	20	25	23	25
total thickness - µm	550	280	325	390	255	295	230	245	240	250	100	108	75	75	116	79
thickness ratio	**1:10**	**1:8.33**	**1:8.28**	**1:8.27**	**1:7.5**	**1:7.42**	**1:6.6**	**1:6**	**1:5**	**1:4**	**1:1.56**	**1:1.27**	**1:1.25**	**1:1.14**	**1:1.07**	**1:1.02**
temperature range °C	4	10	7	11	19	18	20	20	20	20	30	30	30	30	30	30
appearance like	paper	paper	paper	paper	paper	paper	paper	paper	paper	paper	paper	paper	paper	plastic	plastic	plastic
packaging speed – cycles/min.				10.4					12.5			12.8			12.8	
surface tension – mN/m													>44	34		
surface roughness depth - µm													11.1	1.8		
surface slip - µD													0.397	0.173		

[1]: data from *first Bernig declaration (see Appendix B1)*
[2]: data from *second Bernig declaration (see Appendix B2)*

3. Significance of the Experimental Evidence

The experiments reveal that the films according to the invention are superior to the films representative of the prior art regarding the properties of appearance, packaging speed, temperature range for thermoformability, printing and storage properties, and that the claimed ratio of unfilled:filled layer is critical to these properties.

First, the films according to the invention exhibit paper-like appearance, whereas the films representative of the prior art look like plastic, when the ratio of the total thickness of the unfilled layers to the thickness of the filled layer falls below 1:1.2 (compare invention examples 1, 2, Ia, Ib, IIa, IIb, IIc, IId, IIe vs. comparative examples C-2, IIb and IIIc).

Second, the films according to the invention are thermoformable within a broad temperature range (about 18 to 30°C), whereas the films representative of the prior art, in which the ratio of the total thickness of the unfilled layers to the thickness of the filled layer exceeds 1:8, are only thermoformable within a narrow temperature range (about 4 to 11°C) (compare invention examples 1, 2, Ia, Ib, IIa, IIb, IIc, IId, IIe vs. comparative examples C-1, IIa, IIIa, IIIb).

Third, the films according to the invention may be processed at a high packaging speed (more than 12 cycles/min), whereas the films representative of the prior art, in which the ratio of the total thickness of the unfilled layers to the thickness of the filled layer exceeds 1:8, may only be processed at a lower packaging speed (10.4 cycles/min) (compare invention examples Ia and Ib vs. comparative examples C-1 and IIa).

Fourth, as the printing properties are a function of the surface tension of the film, the paper-like inventive films can be printed more easily and with a far higher precision and adhesion of the printing than the films representative of the prior art (compare invention example IIc vs. comparative example IIIc).

Fifth, the better surface texture of the films according to the invention, expressed in a higher average surface roughness depth as well as higher surface slip (resistance), compared to the films representative of the prior art, allows the piling-up of many more packages made of the inventive film during storage and/or for resting on a shelf without any disarrangement than packages made of the plastic films representative of the prior art (compare inventive example IIc vs. comparative example IIIc).

Therefore, as illustrated by the above experimental evidence, the desired features of the films, i.e.

(i) paper-like appearance,

(ii) thermoformability within a broad temperature range,

(iii) processability at a high packaging speed,

(iv) excellent printing properties, and

(v) excellent storage properties,

can only be achieved at a ratio of the total thickness of the unfilled layers to the thickness of the filled layer ranging from 1:8 to 1:1.2 (i.e., feature 3 of claim 1).

Moreover, it has been surprisingly found that - within the above range - the paper-like features of the multilayer barrier film can be achieved even by a single type of inorganic filler (claims 18 and 19). Thus, no combination of two or more different inorganic fillers is required.

A. The Rejection of Claims 1-4, 6, 7, 10, 11, 18 and 19 Based on the Combination of Farrell in View of Miyazaki is Improper

This portion of the Argument applies to Rejection Grounds A, B and part of G.

1. The Examiner's Position

The Examiner argues that Farrell teaches a plastic laminate sheet comprising an outer layer of filled-plastic, an inner layer of HDPE, and an ethylene vinyl alcohol barrier layer interposed between the inner and outer layers. The outer layer has a thickness of 3-7 mils and consists of propylene homopolymers or polypropylene/ HDPE blends. Farrell blends 5 to about 80 percent by weight filler into the outer layer. The filler may be selected from the group consisting of calcium carbonate, talc and mica. The laminate may be thermoformed into a cup.

However, as already admitted by the Examiner, Farrell does not teach the claimed thickness ratio of filled layer to unfilled layers (feature 3 of claim 1).

The Examiner argues that Miyazaki teaches a thermoformed laminate comprising a filled polyolefin resin composition and an unfilled layer(s). Also, Miyazaki would teach that the thickness ratio of the filled layer to unfilled layer is preferably 98:2 to 70:30 in order to assure that the laminate maintains the appearance of paper. Furthermore, the ratio would allegedly be required to obtain a laminate with the touch and feel of paper. Specifically, Miyazaki would

allegedly teach that the thickness of the filled layer to the unfilled layer is critical to maintaining the "high quality impression" of the laminate. The Examiner understands "high quality impression" to refer to the cups' opacity and gloss. The thermoformed product of Miyazaki allegedly exhibits not just the appearance, but also the touch and the feeling characteristics of paper.

The Examiner concludes that the teachings of Miyazaki would have motivated one of ordinary skill in the art to vary the ratio of the total thickness of the unfilled layers to the thickness of the filled layer of the laminates taught by Farrell. The teaching that the thickness ratio must be decreased when the outer layer does not contain any inorganic filler to maintain a high quality impression further allegedly supports the Examiner's position, as Miyazaki would be explicitly teaching that the film's paper-like appearance is deteriorated when the unfilled layer's thickness is too thick. The Examiner concludes that the thickness of the unfilled layer should be minimized to ensure the desired "high quality impression".

Further, Miyazaki and Farrell are alleged to be in the same field of endeavor in that they are both drawn to filled thermoformed laminates. Moreover, the Examiner understands Miyazaki to be reasonably pertinent to the particular problem with which the inventor is concerned - the appearance and texture of a filled thermoformed laminate.

2. Applicant's Position

The Examiner's position cannot be agreed to for the following reasons:

a) The Examiner only considers the paper-like features of the multilayer barrier films [property (i)], while ignoring the remaining properties (ii) through (v). The paper-like features of the films are not the only object the invention is concerned with. As already outlined above, the films of the prior art may not be thermoformed within a temperature range that is as broad as for the films according to the invention [property (ii)]. Furthermore, the packaging speed for the films of the prior art may not be as high as for the films according to the invention [property (iii)]. Hence, the films of the prior art are disadvantageous, particularly when being processed on FFS-machines. Further, the printing and storage properties of the films according to the prior art are not satisfactory in every respect [properties (iv) and (v)].

Thus, the underlying technical problem of the invention is not simply the provision of multilayer barrier films exhibiting paper-like features, but the provision of films which can be easily processed on FFS-machines, even when the packaging is performed discontinuously (page 6, lines 15-17), i.e., the provision of films which can be processed within a broad temperature range at a high packaging speed and which exhibit excellent printing and storage properties.

Neither Farrell nor Miyazaki discloses a multilayer barrier film comprising a sealing layer which forms a surface layer of the film (feature 2.1 of claim 1), let alone that when processing such a sealable film on a form-fill-seal-machine, a broad temperature range for thermoforming is desirable.

Thus, when trying to provide a solution to the problem mentioned above, the skilled artisan had no incentive to even consider the technical teachings of Farrell and Miyazaki, as these references are fully silent in this respect, i.e. they do not address the processability on FFS-machines and are concerned with objects differing from the objects underlying the subject invention.

b) There is no hint in Farrell and Miyazaki that the temperature range for thermoforming is broadened, that the packaging speed may be increased or that the printing properties are improved when the thickness ratio of the unfilled layers to the filled layer is within a certain range (feature 3 of claim 1).

Farrell does not contain any guidance which might lead the person skilled in the art to vary the thickness ratio of the unfilled layers to the filled layers, let alone that a ratio of 1:8 to 1:1.2 (feature 3) would significantly improve the processability of FFS-machines. On the contrary, Farrell even teaches away from adjusting the thickness ratio of unfilled layers to filled layers to obtain a laminate with better thermo-formability characteristics, such as deep drawing qualities, by suggesting that the thickness of each layer is not per se critical when forming the laminate sheet (Farrell, column 4, lines 60-63). Further, Farrell suggests a maximum ratio of 1:1 for the laminate (see Examples I and II at column 5), which is not encompassed by the 1:8 to 1:1.2 range of ratios of the claimed invention.

Miyazaki in no way makes up for the deficiencies of Farrell discussed above. Miyazaki discloses that the ratio in thickness of the filled inner layer (A) to the outer layer (B) is usually from 98:2 to 70:30 (corresponding to 49:1 to 2.3:1). If the outer layer (B) is made of a polyolefin

resin not containing an inorganic filler, it is necessary to decrease the foregoing thickness ratio (A):(B) in order to maintain a high quality of impression (column 8, lines 9-17).

However, as conceded by the Examiner, this disclosure of Miyazaki relates to a two layer structure comprising only layer (A) as an inner layer and layer (B) as an outer layer ("inner" and "outer" referring to the sides of the product, not the position in the laminate). Miyazaki does not teach what the thickness ratio must be for a laminate of three or more layers, as presently claimed.

Furthermore, there is no hint in Miyazaki that the ratio in thickness might influence the processability on FFS-machines. Moreover, there is no hint in Miyazaki to which extent the "foregoing ratio" should be decreased in order to maintain the high quality of impression. In this regard the only information provided by Miyazaki can be found in examples 7 and 9 in which the outer layer is unfilled and the layer ratio is 1:9 and 1:19, respectively. However, these ratios are outside the range defined in claim 1. As illustrated by comparative test IIa of Table I, the packaging speed is rather poor under these circumstances.

It should be emphasized that the solution to the above technical problem can only be achieved by a particular thickness ratio of the unfilled layers to the filled layer ranging from 1:8 to 1:1.2. The inventors have surprisingly found that

- if the thickness ratio is higher than 1:8 the multilayer barrier film may only be thermoformed within a narrow temperature range at a slow packaging speed;
- if the thickness ratio falls below 1:1.2, the multilayer barrier film exhibits a plastic-like appearance (see comparative examples IIb and C-2).

The Examiner's argument that a thickness ratio of from 1:8 to 1:1.2 would be rendered obvious by Miyazaki disclosing a thickness ratio ranging from 1:49 to 1:2.3 is based on hindsight analysis.

c) Even if Miyazaki had motivated the skilled person to decrease the thickness ratio in order to maintain the high quality of impression, the skilled person would certainly not have arrived at the subject matter of claim 1. In view of Farrell and Miyazaki the only feature to control whether the thickness ratio has been sufficiently decreased would be - if at all - the paper-like appearance of the film. However, by only monitoring the paper-like features in dependence on the thickness ratio of the film, it is impossible to realize any effect regarding the

temperature range for thermoforming and the packaging speed. Therefore, once a satisfactory appearance of the film is achieved - far outside the claimed thickness ratio - the skilled artisan would not feel inclined to vary the thickness ratio any further and hence, would not approach the specific ratio ranging from 1:8 to 1:1.2.

d) The Examiner even takes the position that Miyazaki would "explicitly teach" that the film's paper-like appearance is deteriorated when the unfilled layer's thickness is too thick and concludes that according to Miyazaki the thickness of the unfilled layer should be minimized to ensure the desired high quality impression (see Office Action dated February 13, 2004, page 6, first sentence). Applicant cannot follow this interpretation of Miyazaki.

In fact, the quoted passage of Miyazaki only deals with the ratio in thickness of the filled inner layer (A) to the outer layer (B). Furthermore, if the outer layer (B) is unfilled and its thickness is minimized, i.e. decreased, the value of the thickness ratio (A):(B) would certainly be increased, not decreased.

e) Neither Farrell nor Miyazaki discloses a sealing layer which is a surface layer of the film (feature 2.1 in claim 1). The reason for this is simply that Farrell and Miyazaki are both directed to a totally different type of film which is not sealed to another structure to form a package. Neither Farrell nor Miyazaki is in the same field of endeavor as the present invention. The films according to these references are not devoted to films having a sealing layer for forming deep drawn (thermoformed) packages, particularly for processing on FFS-machines (claims 13 and 14). Therefore, Farrell and Miyazaki relate to a technical field differing from the technical field of the present invention.

In sum, the rejections under 35 U.S.C. 103(a) based on the combination of Farrell with Miyazaki are based on an ex-post-facto analysis. Ground of Rejection A, as well as Grounds B and G (based on the same combination and discussed below), should therefore be reversed.

B. The Rejection of Claim 5 Based on the Combination of Farrell in View of Miyazaki and Further in View of Rosen is Improper

This portion of the Argument applies to Rejection Ground B.

1. The Examiner's Position

The Examiner relies upon the combination of Farrell in view of Miyazaki, as discussed above in section VII.A.1. relating to Rejection Ground A. The Examiner acknowledges that neither Farrell nor Miyazaki teaches that a matrix polymer may be adhered without an adhesive to a layer comprising a blend of the matrix polymer with EVOH or PA. However, the Examiner argues that Rosen teaches that it is known to blend a matrix resin with a barrier layer in order to eliminate an adhesive layer between two layers of a laminate (Col. 2, line 54 – Col. 3, line 3). The Examiner concludes that it would have been obvious to utilize a blend of matrix polymer with EVOH or PA as the barrier layer in Farrell, because it is well known that barrier layers comprising such blends adhere directly to layers of the matrix polymer, thus eliminating the need of an adhesive layer.

2. Applicant's Position

While not necessarily agreeing with the Examiner's characterization of Rosen or its possible combinability with Farrell and Miyazaki, Rosen does not make up for the deficiencies discussed above in the combination of Farrell with Miyazaki. Therefore, the combination of Farrell, Miyazaki and Rosen as used in Rejection Ground B is also improper and should be reversed.

C. The Rejection of Claims 1-4, 6, 7, 9-15, 18 and 20 Based on the Combination of Schirmer in View of Miyazaki is Improper.

This portion of the Argument applies to Rejection Grounds C, D, E, F and part of G.

1. The Examiner's Position

The Examiner argues that Schirmer teaches a thermoforming laminate comprising a surface film, a barrier film, and a sealant film. The surface film preferably comprises a polypropylene or ethylene-propylene copolymer. Crosslinking is desirable because it broadens the temperature range at which the laminate may be thermoformed. The laminate may be thermoformed on an FFS-machine and sealed with a lidding film.

However, as already admitted by the Examiner, Schirmer does not teach that the polypropylene sheet may contain 40-75 wt.-% of an inorganic filler.

The Examiner argues that Miyazaki teaches a thermoformable laminate comprising a filled polypropylene layer. The filler should comprise 19-69% of the layer and be selected from the group consisting of talc and titanium dioxide. The amount of filler allegedly regulates the sheet's stiffness, appearance, and thermoformability. The Examiner takes the position that it would have been obvious to one of ordinary skill in the art to add 19-69 parts by weight filler to the propylene layer taught in Schirmer in order to improve the laminate's appearance, stiffness and thermoformability.

Furthermore, as also already admitted by the Examiner, Schirmer does not teach the claimed thickness ratio of unfilled layers to filled layer. However, analogous to the objection based on Farrell, the Examiner takes the position that in view of Miyazaki it would have been obvious to one of ordinary skill in the art to vary the thickness ratio of the filled layer to the unfilled layers in order to obtain the appearance and touch/feel characteristics of paper.

2. Applicant's Position

The Examiner's position cannot be agreed to for the following reasons:

a) Again, the Examiner does not consider all of the properties of the multilayer barrier films according to the invention, particularly that compared to the films of the prior art the packaging speed can be increased [property (iii)] and the printing properties can be improved [property (iv)].

Schirmer aims to achieve from its laminate a clear packaging material with good clarity and gloss (Schirmer, column 1, lines 41-43). Furthermore, Schirmer does not disclose that the packaging speed can be increased or that the printing properties can be improved when the thickness ratio of the unfilled layers to the filled layer is within a certain range (feature 3 in claim 1).

Thus, when trying to provide a solution to the problem underlying the subject invention, the skilled artisan had no incentive to even consider the technical teaching of Schirmer, as this reference is fully silent in this respect, i.e., Schirmer does not address the packaging speed on FFS-machines and is concerned with an object differing from the objects underlying the subject invention.

b) Schirmer does not contain any guidance which might lead the person skilled in the art to vary the thickness ratio of the unfilled layers to the filled layer, let alone that a ratio of 1:8 to 1:1.2 (feature 3 in claim 1) would significantly improve the processability of FFS-machines, particularly allow higher packaging speeds, and would improve the printing properties.

c) Miyazaki does not make up for the deficiencies of Schirmer for the same reasons as discussed above with respect to the combination of Miyazaki with Farrell (see particularly Sections A.2.b) and A.2.c) above.

d) Schirmer teaches away from the subject invention. Schirmer discloses that it is preferred to cross-link at least one of the component films in order to broaden the temperature range at which the materials may be formed in a thermoforming process (Schirmer, column 5, lines 24-29).

In contrast, the components of the multilayer barrier film according to the invention do not require cross-linking. The present inventors have surprisingly found that the broadening of the temperature range at which the materials may be formed in a thermoforming process, as an alternative to cross-linking, can be achieved by adjusting the thickness ratio of the unfilled layers to the filled layer within a certain range (feature 3 in claim1).

Thus, Schirmer leads away from the present invention, as it provides an alternative solution to one of the objects underlying the present invention.

e) A skilled artisan would have found no motivation to combine Schirmer, which seeks a clear package with good clarity, with Miyazaki, which seeks a cup of high whiteness which has a high quality paper-like appearance of reduced luster and transparency impression, and is high in strength, stiffness and stability.

In sum, the rejections under 35 U.S.C. 103(a) based on the combination of Schirmer with Miyazaki are based on an ex-post-facto analysis. Ground of Rejection C, as well as Grounds D, E, F and G (based on the same combination and discussed below), should therefore be reversed.

D. The Rejection of Claim 5 Based on the Combination of Schirmer in View of Miyazaki and Further in View of Rosen is Improper.

This portion of the Argument applies to Rejection Ground D.

1. The Examiner's Position

The Examiner relies on the combination of Schirmer in view of Miyazaki for the same reasons as set forth in Section VII.C.1 relating to Rejection Ground C. The Examiner acknowledges that Schirmer and Miyazaki do not teach that the matrix polymer may be adhered without an adhesive to a layer comprising a blend of the matrix polymer with EVOH or PA. However, the Examiner argues that Rosen teaches that it is known to blend a matrix resin with a barrier layer in order to eliminate an adhesive layer between two layers of a laminate (Col. 2, line 54 – Col. 3, line 3). The Examiner therefore concludes that it would have been obvious to utilize a blend of matrix polymer with EVOH or PA as the barrier layer of the laminate taught by Schirmer, because it is well known that barrier layers comprising such blends adhere directly to layers of the matrix polymer, thus eliminating the need of an adhesive layer.

2. Applicant's Position

While not necessarily agreeing with the Examiner's characterization of Rosen or the combinability of Rosen with Schirmer and Miyazaki, Rosen fails to make up for the deficiencies of the combination of Schirmer in view of Miyazaki for the reasons discussed above in Section VII.C.2. Therefore, the rejection of claim 5 is improper, and Rejection Ground D should be reversed.

E. The Rejection of Claim 8 Based on the Combination of Schirmer in View of Miyazaki and Further in View of Bochow is Improper.

This portion of the Argument applies to Rejection Ground E.

1. The Examiner's Position

The Examiner relies upon the combination of Schirmer in view of Miyazaki as discussed in Section VII.C.1. above. The Examiner acknowledges that neither Schirmer nor Miyazaki teaches that the sealing layer may comprise LDPE or a blend of polybutene and LDPE. However, the Examiner argues that Bochow teaches a multilayer composite film comprising a filled polypropylene film, an adhesive layer, a gas barrier layer, a second adhesive layer, and a heat sealing layer, wherein the heat sealing layer comprises LDPE, polybutylene, ethylene vinyl acetate, ethylene acrylic acid copolymers, and blends thereof (Col. 2, lines 16-28). The Examiner concludes that it would have been obvious to one skilled in the art to utilize LDPE, or

a blend of polybutene and LDPE, as the sealing layer, since Bochow teaches that both compositions are known as good sealing layers in barrier films. The Examiner further argues that the selection of a known material based upon its suitability for its intended use supports a *prima facie* case of obviousness and that LDPE and blends thereof with polybutene fall under the broad teaching of Schirmer that the sealing layer should be a polyolefin.

2. Applicant's Position

Bochow teaches away from the present invention, as discussed more fully below in Section VII.H.2. Therefore, Bochow is not properly combinable with the combination of Schirmer in view of Miyazaki. Further, while not necessarily agreeing with the Examiner's additional characterization of Bochow in the present rejection, Bochow fails to make up for the deficiencies of the combination of Schirmer in view of Miyazaki, as discussed in Section VII.C.2. above. Therefore, the rejection of claim 8 over this combination of references is improper, and Rejection Ground E should be reversed.

F. The Rejection of Claims 16, 17 and 20 Based on the Combination of Schirmer in View of Miyazaki and Further in View of Applicant's Admission is Improper.

This portion of the Argument applies to Rejection Ground F.

1. The Examiner's Position

The Examiner relies upon the combination of Schirmer in view of Miyazaki as discussed above in Section VII.C.1. The Examiner acknowledges that neither Schirmer nor Miyazaki teaches that the lidding film may comprise the multilayered films claimed in claims 16, 17 and 20. However, the Examiner argues that Applicant admits in the specification that the claimed lidding films are well known in the art. The Examiner therefore concludes that it would have been obvious to one skilled in the art to utilize these lidding films because they are commonly used in the art.

2. Applicant's Position

While not necessarily agreeing with the Examiner's characterization of Applicant's admission or its combinability with the combination of Schirmer in view of Miyazaki, Applicant's admission still does not cure the deficiencies of the combination of Schirmer in view

of Miyazaki, as discussed above in Section VII.C.2. Therefore, the rejection of claim 8 over this combination of references is improper, and Rejection Ground F should be reversed.

G. The Rejections of Claim 5 Based on the Combinations of Farrell in View of Miyazaki or Schirmer in View of Miyazaki, Each Further in View of Blemburg are Improper.

This portion of the Argument applies to Rejection Ground G.

1. The Examiner's Position

The Examiner relies upon the combination of Farrell in view of Miyazaki as discussed in Section VII.A.1. above and the combination of Schirmer in view of Miyazaki as discussed in Section VII.C.1. above. The Examiner acknowledges that none of the references teaches that the matrix polymer may be adhered without an adhesive to a layer comprising a blend of the matrix polymer with EVOH or PA. However, the Examiner argues that Blemburg teaches that two layers may be adhered together by blending some of each composition into the adjacent layer (Col. 2, lines 25-31). The Examiner therefore concludes that it would have been obvious to one skilled in the art to utilize a blend of matrix polymer with EVOH or PA as the barrier layer of the laminates taught by Farrell or Schirmer in view of Miyazaki, because of the above teaching of Blemburg.

2. Applicant's Position.

While not necessarily agreeing with the Examiner's characterization of Blemburg or the combinability of Blemburg with either of the combinations of Farrell in view of Miyazaki or Schirmer in view of Miyazaki, Blemburg still fails to cure the deficiencies of the combination of Farrell in view of Miyazaki as discussed in Section VII.A.2. above or the deficiencies of the combination of Schirmer in view of Miyazaki as discussed in Section VII.C.2. above. Therefore, the rejection of claim 5 based on either of these two combinations of references is improper, and Rejection Ground G should be reversed.

H. The Rejection of Claims 1, 2, 4, 6-11, 13, 14, 18 and 19 Based on the Combination of Bochow in view of Hattori is Improper.

This portion of the Argument applies to Rejection Ground H.

1. The Examiner's Position

The Examiner argues that Bochow teaches a multilayer, thermoformable, composite film consisting of the following layers: a surface layer, an adhesive layer which is optional, a gas barrier layer, a second adhesive layer which is also optional, and a heat sealable layer. The surface layer comprises a polypropylene matrix resin and filler. The individual layers have the following thicknesses: surface layer (25-75 μm), barrier layer (10-30 μm), and heat sealable layer (15-150 μm).

However, as already admitted by the Examiner, Bochow does not teach that the filled layer is filled with 40-75 wt.-% of an inorganic filler (based on the total weight of the filled layer) (feature 1.2 in claim 1).

The Examiner argues that Hattori teaches a thermoformable laminate comprising a filled polypropylene layer. The filler should allegedly comprise 5-60% of the layer and be selected from the group consisting of calcium carbonate, silica, talc, clay, mica, titanium dioxide, barium sulfate, and glass fiber. If the amount of filler is less than 5 parts by weight, the heat resistance, stiffness and dimensional stability of the thermoformed product are insufficient. The Examiner takes the position that it would have been obvious to one of ordinary skill in the art to add 5-50 parts by weight filler to the propylene layer taught in Bochow in order to improve the laminate's heat resistance, stiffness, and dimensional stability.

2. Applicant's Position

The Examiner's position cannot be agreed to for the following reasons:

a) The Examiner again considers only the paper-like features of the films, but not the processability on FFS-machines [properties (ii) and (iii)] or the printing properties [property (iv)].

Bochow aims at providing a composite film having a limited thermoformability (column 1, lines 40-47), whereas the present invention is concerned with a multilayer barrier film having an improved thermoformability. Thus, Bochow teaches away from the subject invention.

Furthermore, although Bochow teaches that the composite film can be thermoformed in standard automatic machines, there is no hint that the temperature range for thermoforming [property (ii)] or the packaging speed [property (iii)] might be problematic, let alone that these

properties may be improved by adjusting the thickness ratio of the unfilled layers to the filled layer within a certain range.

Bochow is concerned with an object differing from the objects underlying the subject invention. As the present invention does not aim at providing a multilayer barrier film having an improved heat resistance, but rather showing paper-like features, being thermoformable within a broad temperature range, being processable at a high packaging speed on FFS-machines and exhibiting excellent printing properties, the average skilled person had no incentive to consider the teaching of Bochow in order to solve the problem posed.

b) Neither Bochow nor Hattori contains any guidance which might motivate the person skilled in the art to adjust the thickness ratio of the unfilled layers to the filled layer within the critical ratio of from 1:8 to 1:1.2 (feature 3 in claim 1) in order to improve the processability of the film on FFS-machines or to improve the printing properties.

All of the examples of Bochow show thicknesses of unfilled layers higher than the thicknesses of the respective filled layers. Accordingly, a skilled artisan would not have been motivated to choose the proper ratios (with the unfilled layers being thinner than the filed layers) from the thicknesses of the layers listed in Bochow to achieve the critical ratios of the claimed invention. Stated otherwise, the filled layer of the present invention is 20 to 700 percent greater in thickness than the unfilled layers.

c) Hattori in no way makes up for the deficiencies of Bochow discussed above. In fact, the results obtained by Hattori are not comparable to the results of the presently claimed invention, but are largely just the opposite.

First, the intent of Hattori is to produce a laminated sheet having a surface layer with excellent gloss (i.e., plastic appearance) instead of a paper-like appearance according to the invention.

Second, the effect of the change in ratio of layer A (essentially unfilled layer) to layer B (essentially filled layer) of Hattori is the opposite of the change in ratio of the unfilled to filled layers of the films of the invention (see Hattori, column 5, lines 31-46). As the thickness of layer A (unfilled layer) decreases, the gloss (plastic appearance) remarkably drops, while when the thickness of layer A increases, the deep drawing performance deteriorates. In contrast, as seen

from the comparative tests provided by applicant in Table I, when the thickness of the unfilled layers (relative to the filled layer) of the films according to the subject invention is increased, the appearance of the film becomes more plastic and the range of thermoforming temperature actually improves.

Similarly, when the thickness of layer B (filled layer) of Hattori decreases below a lower limit of 55%, the deep drawing performance deteriorates, and as the thickness increases, a sufficient gloss layer cannot be obtained. Again, the comparative tests provided by applicant in Table I to show that with the films of the subject invention a thinner filled layer (relative to the unfilled layers) results in a much greater range of thermoforming temperature, i.e., an improvement, not a deterioration.

Hence, even if - for the sake of argument - Hattori were properly combinable with Bochow, one skilled in the art would not expect the combination of advantageous properties of the films of the presently claimed invention, namely both paper-like texture and appearance and very good thermoforming properties.

d) According to Hattori layer A contains up to 5% by weight of an inorganic or organic nucleating agent, such as calcium carbonate, silica, talc, clay, titanium oxide or barium sulfate (Hattori, column 3, lines 8/9). Addition of the nucleating agent to layer A improves the heat resistance, stiffness, scratch resistance, dimensional stability and gloss of the product (Hattori, column 3, lines 21-24).

Even if the skilled artisan had tried to improve the laminate's heat resistance, stiffness, and dimensional stability - as alleged by the Examiner - he would certainly have added up to 5% of a nucleating agent into layer A, thereby arriving at a multilayer film having no unfilled layers at all. Thus, Hattori teaches away from the subject matter of present claim 1.

e) The total thickness of the laminated sheets according to Hattori is about 1,500 µm (Hattori, column 5, line 66; column 8, line 3). Thus, layer B containing 60 to 5 parts by weight of an inorganic filler has a thickness within the range of about 825 to 1,490 µm (55 to 99.5% of the total thickness of the sheet). In contrast, according to Bochow the filled layer preferably has a thickness of 25-75 µm (Bochow, column 2, line 56).

Thus, one of ordinary skill would not have had an expectation of success in combining Hattori having its much thicker filled layer with Bochow having a much thinner filled layer to achieve the claimed invention, as Hattori teaches that a thickness less than its lower limit for the above specified range decreases the desirable properties of its laminate (Hattori, column 5, lines 42-44). Also for that reason Hattori teaches away from the subject matter of present claim 1.

f) Hattori teaches that the thermoforming properties of the film are influenced by the type of polymers used for the different layers of the film and the combination of the layers made of different polymers (Hattori, column 1 and Table 1). As shown in Table 1 and claim 1 of Hattori, the melt flow rate and the Q value (Mw/Mn) of the polymers have an important influence on the properties of the film. Hattori does not disclose that the unfilled layers comprise at least a barrier layer. Therefore, a skilled artisan is directed away from combining Hattori with Bochow to change the combination of the film layers, such as adding a barrier layer.

g) Hattori seeks to maintain a proper balance of stiffness and thermoformability while Bochow seeks a high degree of stiffness and limited thermoformability. Accordingly, a skilled artisan seeking to achieve the limited thermoformability of Bochow would not have looked at Hattori which tries to improve thermoformability for the amount of filler to add to achieve this property.

h) The films according to Hattori do not contain a sealing layer and hence, relate to a technical field differing from the technical field of the present invention.

In sum, under 35 U.S.C. 103(a) over the combination of Bochow in view of Hattori is based on an ex-post-facto analysis. Thus, the Examiner is respectfully requested to reconsider the objection raised. Ground H of the rejections should therefore be reversed.

VIII. CONCLUSION

For the reasons set forth above, Appellants respectfully submit that the Examiner has failed to make out a *prima facie* case of obviousness, and even if he had, the *prima facie* case has been overcome by the evidence of unexpected results, so that pending claims 1-20 are patentable over the prior art cited by the Examiner. Reversal of the rejections and issue of a notice of allowance are respectfully requested at the earliest opportunity.

Respectfully submitted,

ULRICH REINERS ET AL.

February 16, 2005 By: William W. Schwarze
(Date)

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WWS/rc
Enclosure: Petition for Extension of Time (four-months)
Attachments: Appendix A - Claims in Present Form
Appendix B – Evidence Submitted by Applicant

APPENDIX A
CLAIMS IN PRESENT FORM
U.S. PATENT APPLICATION SERIAL NO.: 09/851,460

1. (Previously Presented) A multilayer barrier film comprising a filled layer based on polypropylene and a plurality of unfilled layers, wherein the filled layer is filled with 40-75 weight %, based on the total weight of the filled layer, of an inorganic filler, forms one of the two surface layers of the film, and has a thickness of 40 μm to 400 μm, the unfilled layers comprising at least a barrier layer and a sealing layer and optionally at least one adhesive layer, and the ratio of the total thickness of the unfilled layers to the thickness of the filled layer being from 1:8 to 1:1.2, wherein the sealing layer forms the other of the two surface layers of the film and the barrier layer is sandwiched between the filled layer and the sealing layer.

2. (Original) The multilayer barrier film according to claim 1, wherein the filled layer is selected from the group consisting of polypropylene, propylene/ethylene copolymer, and mixtures thereof as a polymer matrix.

3. (Original) The multilayer barrier film according to claim 1, wherein the inorganic filler is selected from the group consisting of calcium carbonate, calcium sulfate, talcum powder, titanium dioxide, kaolin and silicon dioxide.

4. (Original) The multilayer barrier film according to claim 1, wherein the barrier layer is selected from the group consisting of ethylene vinyl alcohol copolymer (EVOH), polyvinylidene chloride (PVDC), and polyamide (PA) and is bonded to the filled layer via at least one adhesive layer.

5. (Original) The multilayer barrier film according to claim 1, wherein the barrier layer comprises a mixture of a matrix polymer with EVOH or PA and is bonded to the filled layer without any adhesive layer.

6. (Original) The multilayer barrier film according to claim 4, wherein the barrier layer comprises EVOH.

7. (Original) The multilayer barrier film according to claim 1, wherein the sealing layer comprises an ethylene polymer.

8. (Original) The multilayer barrier film according to claim 7, wherein the ethylene polymer comprises polyethylene of low density (LDPE), optionally mixed with polybutylene, and the sealing layer is bonded to the barrier layer via an adhesive layer.

9. (Original) The multilayer barrier film according to claim 7, wherein the ethylene polymer comprises ethylene vinyl acetate copolymer, and the sealing layer is bonded to the barrier layer without any adhesive layer.

10. (Original) The multilayer barrier film according to claim 4, wherein the adhesive layers comprise different materials.

11. (Original) The multilayer barrier film according to claim 1, wherein the relation of the thickness of the unfilled layers to the thickness of the filled layer is between 1:4 and 1:2.

12. (Original) The multilayer barrier film according to claim 1, wherein the film is printed and laminated by adhesives after a corona, flame, fluorine or plasma pretreatment.

13. (Original) The multilayer barrier film according to claim 1, wherein the film is in the form of a packaging material formed on a form-, fill- and seal-machine (FFS-machine).

14. (Original) A packaging material for perishable kinds of food, especially meat and poultry, comprising a multilayer barrier film according to claim 1 formed on a FFS-machine by thermo-forming.

15. (Original) A package comprising a tray-like lower part produced from a multilayer barrier film according to claim 1 and sealed by a lidding film.

16. (Previously Presented) The package according to claim 15, wherein the lidding film comprises a multilayer film with the following sequence of layers: polyester terephthalate (PET)/PVDC/adhesive /LDPE or PET/adhesive/polyethlene (PE) /adhesive /EVOH/adhesive/PE.

17. (Previously Presented) The package according to claim 15, wherein the lidding film comprises the layers PET/SiO_x/adhesive/LDPE.

18. (Previously Presented) The multilayer barrier film according to claim 1, wherein the inorganic filler consists essentially of a single filler.

19. (Previously Presented) The multilayer barrier film according to claim 18, wherein the single filler is calcium carbonate.

20. (Previously Presented) The packaging material according to claim 15, wherein the lidding film is sealed to the sealing layer of the multilayer barrier film.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Ulrich Reiners et al.
Application NO.: 09/851,460
FILED: 8 May, 2001
FOR: PAPER-LIKE AND THERMO-FORMABLE MULTILAYER BARRIER FILM

DECLARATION UNDER 37 C.F.R. § 1.132

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

I, Bernig Walter, hereby declare as follows:

1. I am a citizen of Germany, residing at Rottachbergweg 5
87549 Rettenberg

2. I studied chemistry at the Fachhochschule of Aalen and received a degree in the field chemical engineering in the year 1977.

3. Since 1.4.1987 I have been employed as a project engineer/manager R&D in the field of Research and Development films for deep draw applications and shrink bags for shrink bag applications and I am still working in this field for the company of Convenience Food Systems, Kempten, Germany, an affiliated company of Convenience Food Systems B.V.

4. The following tests were made under my supervision and control:

I. Films according to the US patent application 09/851,460

Ia. Test

A film with six layers is produced according to the blown film coextrusion procedure. The sequence of the layers is: AA`BCDE.

Layer A consists of: 53 weight-% of a calcium carbonate with an average particle size of 4,5 µm and 47 weight-% of a homopropylene with a melting index of 2,1 g/10 min.

Layer A` consists of:100 weight-% of a LDPE with a melting index of 0,85 g/10 min and a density of 0,922 g/cm³.

Layer B consists of: 100 weight-% of an acid-modified ethylene methacrylate copolymer with a melting point of 108^{0}C and a melting index of 3,0 /10 min and functions as adhesive layer.

Layer C consists of: 100 weight-% of an ethylene vinylalcohol copolymer with an ethylene percentage of 38 mol-% and a melting index of 5,5 g /10 min and functions as barrier layer.

Layer D consists of: 100 weight-% of an acid-modified polypropylene with a melting index of 3,5 g/10 min and functions as adhesive layer.

Layer E consists of: 87 weight-% of a polyethylene with a density of 0,9250 g/cm^3 and a melting index of 2,0 g /10 min and 13 weight-% of a polybutylene with a melting index of 1,0 g /10 min and functions as sealing layer.

The thicknesses of the layers are:

Layer A	200 µm
Layer A`	10 µm
Layer B	3 µm
Layer C	4 µm
Layer D	3 µm
Layer E	20 µm.

The total thickness of the multilayer film is 240 µm. The ratio of the thickness of the unfilled layers to that of the filled layer is 1:5

Ib. Test

In this text the layers of the multilayered film are composed as in Test Ia.

The thickness of each layer is:

Layer A	60 µm
Layer A`	15 µm
Layer B	3 µm
Layer C	4 µm
Layer D	3 µm
Layer E	23 µm.

The total thickness of the multilayer film is 109 µm. The ratio of the thickness of the unfilled layers to that of the filled layer is 1:1,27

II. Comparison films

IIa. Test

The film used has the same composition of the layers as described in Test Ia.

The thicknesses of the layers, however, are:

Layer A	350 µm
Layer A`	10 µm
Layer B	3 µm
Layer C	4 µm
Layer D	3 µm
Layer E	20 µm.

The total thickness of the multilayer film is 390 µm. The ratio of the thickness of the unfilled layers to that of the filled layer is 1:8,27

IIb. Test

The film used has the same composition of layers as in Test Ia.
The thicknesses of the layers, however, are as follows:

Layer A	60 µm
Layer A`	23 µm
Layer B	3 µm
Layer C	4 µm
Layer D	3 µm
Layer E	23 µm.

The total thickness of the multilayer film is 116 µm. The ratio of the thickness of the unfilled layers to that of the filled layer is 1:1,07.

The melting indices cited in the Tests were determined according to ASTM 1238.

III. Properties of the films according the Tests Ia to IIb

Film according to	range of thermo-forming (°C)	packaging speed (cycles per minute)*	appearance of the film
Test I a	125 to 145	**12,5**	paper-like
Test II a	145 to 156	**10,4**	paper-like
Test I b	115 to 145	**12,8**	paper-like
Test II b	115 to 145	**12,8**	plastic

*** Determination of the packaging speed**

Test IVa

Packaging articles (trays) made of the inventive film according to Test Ia are formed at 135°C for 15 min on a FFS machine. The process is interupted, the tray insert of the machine is changed and trays with another dimension made of the inventive film according to Ia are produced again at 135°C for 15 min. Then trays made of the inventive film according to Test Ib are formed at 135°C for 15 min. The process is interupted, the tray insert of the machine is changed and trays with another dimension made of the inventive film according to Test Ib are produced again at 135°C for 15 min.

Test IVb

Packaging articles (trays) made of the film according to Test IIa are formed at 145°C for 15 min on a FFS machine. The process is interupted, the tray insert of the machine is changed and trays with another dimension made of the film according to Test IIa are produced again at 145°C for 15 min. Than trays made of the film according to

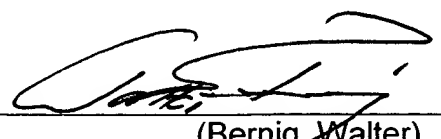
Test IIb are formed at 135°C for 15 min. The process is interupted, the tray insert of the machine is changed and trays with another dimension made of the film according to Test IIb are produced again at 135°C for 15 min.

The packaging speed is determined as the number of produced packaging articles in one hour under the mentioned conditions.

V. Results

The Tests show that for the combination of advantageous properties of the film, as packaging material especially for the combination of the paper-like appearance and the very good thermoforming properties, the ratio of the total thickness of the unfilled layers to the thickness of the filled layer is essential. The comparison of Test IVa with Test IVb indicate that the packaging speed for the films according to the US patent application No. 09/851,460 is higher than for films with a ratio of the total thickness of the unfilled layers to the thickness of the filled layer outside the inventive range.

All statements made herein of my own knowledge are true, and all statements made on information and belief are believed to be true, and further, these statements were made with the knowledge that willful false statements and the like, so made, are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the patent application or any patent issued thereon.

7. 1. 2002 

(Date) (Bernig, Walter)

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO: ASSISTANT COMMISSIONER FOR PATENTS, WASHINGTON, DC 20231, ON THE DATE INDICATED BELOW.

BY: Victoria L. Jones DATE: 3/11/03

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re:	Patent Application of Ulrich Reiners, *et al.*	:	Group Art Unit 1773
Conf. No.:	4175	:	
Appln. No.	09/851,460	:	Examiner: Kevin R. Kruer
Filed:	May 8, 2001	:	
For:	PAPER-LIKE AND THERMO-FORMABLE MULTILAYER BARRIER FILM	:	Attorney Docket No. **9784-3U2 (TH8002US/B)**

SECOND DECLARATION OF WALTER BERNIG UNDER 37 C.F.R. § 1.132

I, Walter Bernig, hereby declare as follows:

1. I am the same Walter Bernig who executed a prior Declaration Under 37 C.F.R. § 1.132, dated January 7, 2002 ("First Declaration"), which I understand was filed in the above application on January 14, 2002.

2. I am still employed by Convenience Food Systems, Kempten, Germany, an affiliated company of Convenience Food Systems B.V. and assignee of the above application.

3. The following additional tests were made under my supervision and control:

I. Layer composition

For each test below (both according to the invention of the above application and comparison tests) a multilayer film with three layers was produced according to the blown film coextrusion procedure. The sequence of the layers was: ABC, i.e., layer B was sandwiched between layers A and C. The layers had the following compositions:

Layer A (filled layer) consists of: 53 weight-% of a calcium carbonate with an average particle size of 4.5 µm and 47 weight-% of a polypropylene with a melt index of 2.1 g/10 min.

Layer B (barrier layer) consists of: 40 weight-% of an ethylene vinyl alcohol copolymer with an ethylene percentage of 38 mol-% and a melt index of 5.5 g/10min and 60 weight-% of the same polypropylene as layer A.

Layer C (sealing layer) consists of: 100 weight-% of an ethylene vinyl acetate copolymer with a melt index of 2 g /10 min.

II. Inventive Films according to US patent application 09/851,460

The following multilayer films (II a thru II e) were produced within the scope of the claims of the above application with filled layer A and unfilled layers B and C, as described above.

II a. Test

The thickness of each layers was:

Layer A	200 µm
Layer B	10 µm
Layer C	20 µm.

The total thickness of the multilayer film was 230 µm. The ratio of the thickness of the unfilled layers to that of the filled layer was 1:6.6

II b. Test

The thickness of each layer was:

Layer A	225 µm
Layer B	10 µm
Layer C	20 µm.

The total thickness of the multilayer film was 255 µm. The ratio of the thickness of the unfilled layers to that of the filled layer was 1:7.5.

II c. Test

The thickness of each layer was:

Layer A	45 µm
Layer B	10 µm
Layer C	20 µm

The total of the thickness of the multilayer film was 75 µm. The ratio of the thickness of the unfilled layers to that of the filled layer was 1:1.25.

II d. Test

The thickness of each layer was:

Layer A	260 μm
Layer B	10 μm
Layer C	25 μm

The total thickness of the multilayer film was 295 μm. The ratio of the thickness of the unfilled layers to that of the filled layer was 1:7.42.

II e. Test

The thickness of each layer was:

Layer A	210 μm
Layer B	10 μm
Layer C	25 μm

The total thickness of the multilayer film was 245 μm. The ratio of the thickness of the unfilled layers to that of the filled layer was 1:6.

III. Comparison films

The following multilayer films (III a thru III c) were produced with filled layer A and unfilled layers B and C, as described above, but for comparison purposes with the ratios of the thickness of the unfilled layers to the thickness of the filled layer in each case being outside the scope of the claims of the above application.

III a. Test

The thickness of each layer was:

Layer A	250 μm
Layer B	10 μm
Layer C	20 μm

The total thickness of the multilayer film was 280 μm. The ratio of the thickness of the unfilled layers to that of the filled layer was 1:8.33.

III b. Test

The thickness of each layer was:

Layer A	290 μm
Layer B	10 μm
Layer C	25 μm

The total thickness of the multilayer film was 325 μm. The ratio of the thickness of the unfilled layers to that of the filled layer was 1:8.28.

III c. Test

The thickness of each layer was:

Layer A	40 μm
Layer B	10 μm
Layer C	25 μm

The total thickness of the multilayer film was 75 μm. The ratio of the thickness of the unfilled layers to that of the filled layer was 1:1.14.

IV. Properties of the films in the Tests of II and III above

4.1 The range of thermoforming temperature (°C) was determined and the appearance was recorded for each multilayer film produced according to Tests II a. thru III d. above. These data are set forth in TABLE 1 below.

TABLE 1

Inventive Film Tests

Film According to Test	Unfilled/Filled Layer Ratio	Range of Thermo-forming Temp. (°C)	Appearance of the Film
II a	1:6.6	125 - 145	paper-like
II b	1:7.5	126 - 145	paper like
II c	1:1.25	115 - 145	paper-like
II d	1:7.42	127 - 145	paper-like
II e	1:6	125 - 145	paper-like

Comparison Film Tests

Film According to Test	Unfilled/Filled Layer Ratio	Range of Thermo-forming Temp. (°C)	Appearance of the Film
III a	1:8.33	140 - 150	paper-like
III b	1:8.28	145 - 152	paper-like
III c	1:1.14	115 - 145	plastic

4.2 The multilayer films according to Test II c and Test III c were further examined by measuring their surface tension according to DIN 53364, their average surface roughness depth according to DIN EN ISO 4288 and their surface slip according to DIN 53375 A to assess the surface texture as well as other surface properties of the films. The data measured are set forth in TABLE 2 below.

TABLE 2

Measured property	Film according to Test II c	Film according to Test III c	Method according to Deutsche Industrie Norm
	paper like	plastic	
surface tension [mN/m]	> 44	34	DIN 53364
average surface roughness depth [µm]	11.1	1.8	DIN EN ISO 4288
surface slip [µD]	0.397	0.173	DIN 53375 A

V. Discussion of Results:

5.1. The above Tests of Paragraph 4.1 show that for the combination of advantageous properties of the film as packaging material, especially for the combination of the paper-like appearance and the very good thermoforming properties (i.e., wide temperature range for thermoformability), the inventive ratio of the total thickness of the unfilled layers to the thickness of the filled layer, namely 1:8 to 1:1.2, is essential. That is, as shown in TABLE 1 above, the inventive films having ratios within this range exhibit both wide thermoforming temperature ranges and paper-like appearance. In contrast, for the comparison films, when the ratio is too low, i.e., less than 1:8 (see Tests III a and III b), the films have a paper-like appearance, but the thermoforming temperature range is very narrow, while when the ratio is too high, i.e., greater than 1:1.2 (see Test III c), the films have a broad thermoforming temperature range, but a plastic appearance.

5.2 The above measurements of Paragraph 4.2 are an attempt to quantify the importance of the paper-like properties of the multilayer films of the present invention. Thus, the paper-like appearance and texture of the films are not only important from the standpoint of customer acceptance, but also have important benefits to the manufacturer of the packaging made from the films and the distributors and sellers of products packaged in the films.

First, it is general knowledge that the higher the surface tension of a film is, the better the printing properties of such a film are. Accordingly, the paper-like inventive film obtained according to Test II c could be printed on much more easily and with a far higher precision and adhesion of the printing than the plastic film obtained according to Test III c.

Second, the better surface texture of the film obtained according to Test II c, expressed in a higher average surface roughness depth as well a higher surface slip (resistance), compared to the film obtained according to Test III c, allows the piling-up of many more packages made of the inventive film during storage and/or for resting on a shelf without any disarrangement than packages made of the plastic film according to Test III c.

5.3 I understand that the Examiner in the above application has raised several concerns about the data presented in my First Declaration:

(a) First, the Examiner was concerned that too many variables (e.g., individual layer thickness, total layer thickness, layer ratio) were being changed, so that it is difficult to determine which variable is critical and responsible for the unexpected properties. It is impossible to keep all variables but one constant and still show a wide range of data points. For example, to show both ends of the ratio range, either the total thickness or the thickness of one layer or both must also change. However, to address this concern, I have attempted to keep as many variables constant as possible. Therefore, in the above tests, I have kept the unfilled layer thicknesses essentially constant at 30-35μm.

(b) Second, the Examiner was concerned that there were not enough data points to demonstrate the unexpected results across the entire claimed range. The above tests address this concern by providing five data points within the range, including points near both ends, and three data points outside the range, including points both above and below the range near the ends. These data points are in addition to the four data points (two inside and two outside the range) which were provided in my First Declaration.

(c) Third, the Examiner was concerned about the effect of the three adhesive layers in each of the multilayer films of my first Declaration, since the present claims require a minimum of three layers, with adhesive layers being only optional. To address this concern, all of the multilayer films in the above tests include only the minimum three layers (filled, barrier and sealing).

Accordingly, I believe that all the Examiner's concerns have been addressed and that the above test results demonstrate criticality of the claimed range of the present invention, which is not at all recognized in the prior art, but is unexpected.

I declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like, so made, are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the patent application Serial No. 09/851,460 or any patent issued thereon.

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(Date) (Walter Bernig)

(c) Third, the Examiner was concerned about the effect of the three adhesive layers in each of the multilayer films of my first Declaration, since the present claims require a minimum of three layers, with adhesive layers being only optional. To address this concern, all of the multilayer films in the above tests include only the minimum three layers (filled, barrier and sealing).

Accordingly, I believe that all the Examiner's concerns have been addressed and that the above test results demonstrate criticality of the claimed range of the present invention, which is not at all recognized in the prior art, but is unexpected.

I declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like, so made, are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the patent application Serial No. 09/851,460 or any patent issued thereon.

10. 3. 2003
(Date)

(Walter Bernig)